

**Claims**

1. A nutritional composition suitable for facilitating bone healing in a mammal, comprising lysine, proline, ascorbic acid, copper, and vitamin B<sub>6</sub>.
2. The nutritional composition of claim 1, wherein the nutritional composition contains 27-34 % wt lysine, 14-15 % wt proline, and 42-47 % wt ascorbic acid.
3. The nutritional composition of claim 1, wherein the nutritional composition provides a daily dosage of
  - a) 230 mg – 10 grams lysine, 120 mg - 5 grams proline, 360 mg – 15 grams ascorbic acid, 1.5 µg – 20 mg copper, and 0.2 mg - 20 mg vitamin B<sub>6</sub>;
  - b) 1,010 mg – 8 grams lysine, 560 mg - 4 grams proline, 1,500 mg – 9 grams ascorbic acid, 2 µg – 6 mg copper, and 0.5 mg – 10 mg vitamin B<sub>6</sub>; or
  - c) 1,010 mg lysine, 560 mg proline, 1,500 mg ascorbic acid, 330 µg copper and 10 mg vitamin B<sub>6</sub>.
4. The nutritional composition of claim 1, wherein said composition provides a daily dosage per body weight of
  - a) 3.2 – 139 mg/kg lysine, 1.7 – 69.4 mg/kg proline, 5 – 208.3 mg/kg ascorbic acid, 0.02 – 278 µg/kg copper, 2.78 – 279 µg/kg vitamin B<sub>6</sub>;
  - b) 14 – 111 mg/kg lysine, 7.8 – 55.6 mg/kg proline, 20.8 - 125 mg/kg ascorbic acid, 0.03 – 83.3 µg/kg copper, and 6.94 – 139 µg/kg vitamin B<sub>6</sub>; or
  - c) 14 mg/kg lysine, 7.8 mg/kg proline, 20.8 mg/kg ascorbic acid, 4.6 µg/kg copper, 139 µg/kg vitamin B<sub>6</sub>.
5. The nutritional composition of any one of claims 1 to 4, wherein the nutritional composition further comprises vitamin A, vitamin D<sub>3</sub>, vitamin E, vitamin B<sub>1</sub>, vitamin B<sub>2</sub>, niacin, folic acid, vitamin B<sub>12</sub>, biotin, pantothenic acid, calcium, phosphorus, magnesium, zinc, selenium, manganese, chromium, molybdenum, potassium, citrus fruit peel bioflavonoids, arginine, cysteine, inositol, carnitine, coenzyme Q<sub>10</sub>, and pycnogenol.
6. The nutritional composition of claim 5, wherein the nutritional composition provides a daily dosage of

- a) 67 µg -100 mg vitamin A, 0.7 µg - 50 µg vitamin D<sub>3</sub>, 0.7 µg - 50 µg vitamin E, 1.4 mg - 8 mg vitamin B<sub>1</sub>, 1.4 mg - 8 mg vitamin B<sub>2</sub>, 9 mg - 250 mg niacin, 18 µg - 500 µg folic acid, 4 µg - 100 µg vitamin B<sub>12</sub>, 13 µg - 400 µg biotin, 8 mg - 100 mg pantothenic acid, 7 mg - 40 mg calcium, 3 mg - 300 mg phosphorus, 40 mg - 200 mg magnesium, 0.5 mg - 10 mg zinc, 20 µg - 300 µg selenium, 0.8 mg - 15 mg manganese, 2 µg - 200 µg chromium, 0.8 µg - 100 µg molybdenum, 4 mg - 300 mg potassium, 20 mg - 500 mg citrus fruit peel bioflavanoids, 10 mg - 500 mg arginine, 10 mg - 400 mg cysteine, 5 mg - 400 mg inositol, 5 mg - 400 mg carnitine, 1.6 mg - 70 mg coenzyme Q<sub>10</sub>, and 1.6 mg - 70 mg pycnogenol;
  - b) 166 µg -50 mg vitamin A, 1.65 µg - 20 µg vitamin D<sub>3</sub>, 1.65 µg - 20 µg vitamin E, 3.5 mg - 7 mg vitamin B<sub>1</sub>, 3.5 mg - 7 mg vitamin B<sub>2</sub>, 22.5 mg - 100 mg niacin, 45 µg - 300 µg folic acid, 10 µg - 50 µg vitamin B<sub>12</sub>, 32 µg - 300 µg biotin, 20 mg - 60 mg pantothenic acid, 17 mg - 35 mg calcium, 7 mg - 100 mg phosphorus, 50 mg - 100 mg magnesium, 3 mg - 8 mg zinc, 30 µg - 250 µg selenium, 1 mg - 3.25 mg manganese, 2 µg - 75 µg chromium, 2 µg - 75 µg molybdenum, 8 mg - 200 mg potassium, 50 mg - 250 mg citrus fruit peel bioflavanoids, 100 mg - 300 mg arginine, 80 mg - 200 mg cysteine, 80 mg - 200 mg inositol, 80 mg - 200 mg carnitine, 3 mg - 35 mg coenzyme Q<sub>10</sub>, and 3 mg - 35 mg pycnogenol; or
  - c) 333 µg vitamin A, 3.3 µg vitamin D<sub>3</sub>, 3.3 µg vitamin E, 7 mg vitamin B<sub>1</sub>, 7 mg vitamin B<sub>2</sub>, 45 mg niacin, 90 µg folic acid, 20 µg vitamin B<sub>12</sub>, 65 µg biotin, 40 mg pantothenic acid, 35 mg calcium, 15 mg phosphorus, 40 mg magnesium, 7 mg zinc, 20 µg selenium, 1.3 mg manganese, 10 µg chromium, 4 µg molybdenum, 20 mg potassium, 100 mg citrus fruit peel bioflavanoids, 40 mg arginine, 35 mg cysteine, 35 mg inositol, 35 mg carnitine, 7 mg coenzyme Q<sub>10</sub>, and 7 mg pycnogenol.
1. The nutritional composition of claim 5, wherein said composition further comprises in a daily dosage per body weight of
- a) 0.9-1,390 µg/kg vitamin A, 0.01-0.694 µg/kg vitamin D<sub>3</sub>, 0.01-0.694 µg/kg vitamin E, 19.4-111 µg/kg vitamin B<sub>1</sub>, 19.4-111 µg/kg vitamin B<sub>2</sub>, 125-3,472 µg/kg niacin, 0.25-6.94 µg/kg folic acid, 0.05-1.39 µg/kg vitamin B<sub>12</sub>, 0.181-5.56 µg/kg biotin, 111-1,390 µg/kg pantothenic acid, 97.2-555 µg/kg calcium, 42-4,167 µg/kg phosphorus, 555-2,778 µg/kg magnesium, 6.9-139 µg/kg zinc, 0.28-4.17 µg/kg selenium, 11.1-208.3 µg/kg manganese, 0.03-2.78 µg/kg chromium, 0.01-1.39

- $\mu\text{g/kg}$  molybdenum, 55.6-4,167  $\mu\text{g/kg}$  potassium, 278-6.944  $\mu\text{g/kg}$  citrus fruit peel bioflavonoids, 139-6,944  $\mu\text{g/kg}$  arginine, 135-5,555  $\mu\text{g/kg}$  cysteine, 69-5,555  $\mu\text{g/kg}$  inositol, 69-5,555  $\mu\text{g/kg}$  carnitine, 22.2-972  $\mu\text{g/kg}$  coenzyme Q<sub>10</sub>, and 22.2-972  $\mu\text{g/kg}$  pycnogenol;
- b) 2.31-694  $\mu\text{g/kg}$  vitamin A, 0.023-0.278  $\mu\text{g/kg}$  vitamin D<sub>3</sub>, 0.023-0.278  $\mu\text{g/kg}$  vitamin E, 48.6-97.2  $\mu\text{g/kg}$  vitamin B<sub>1</sub>, 48.6-97.2  $\mu\text{g/kg}$  vitamin B<sub>2</sub>, 312.5-3,190  $\mu\text{g/kg}$  niacin, 0.6-4.17  $\mu\text{g/kg}$  folic acid, 0.14-0.69  $\mu\text{g/kg}$  vitamin B<sub>12</sub>, 0.444-4.17  $\mu\text{g/kg}$  biotin, 278-833  $\mu\text{g/kg}$  pantothenic acid, 236-903  $\mu\text{g/kg}$  calcium, 97.2-1,390  $\mu\text{g/kg}$  phosphorus, 694-1,390  $\mu\text{g/kg}$  magnesium, 41.7-111  $\mu\text{g/kg}$  zinc, 0.42-3.47  $\mu\text{g/kg}$  selenium, 13.9-45.1  $\mu\text{g/kg}$  manganese, 0.07-2.78  $\mu\text{g/kg}$  chromium, 0.03-1.04  $\mu\text{g/kg}$  molybdenum, 111.1-2,778  $\mu\text{g/kg}$  potassium, 694-3,472  $\mu\text{g/kg}$  citrus fruit peel bioflavonoids, 1,389-4,167  $\mu\text{g/kg}$  arginine, 1,111-2,778  $\mu\text{g/kg}$  cysteine, 1,111-2,778  $\mu\text{g/kg}$  inositol, 1,111-2,778  $\mu\text{g/kg}$  carnitine, 41.7-486  $\mu\text{g/kg}$  coenzyme Q<sub>10</sub>, and 41.7-486  $\mu\text{g/kg}$  pycnogenol; or
- c) 4.6  $\mu\text{g/kg}$  vitamin A, 0.046  $\mu\text{g/kg}$  vitamin D<sub>3</sub>, 0.046  $\mu\text{g/kg}$  vitamin E, 97.2  $\mu\text{g/kg}$  vitamin B<sub>1</sub>, 97.2  $\mu\text{g/kg}$  vitamin B<sub>2</sub>, 625  $\mu\text{g/kg}$  niacin, 1.25  $\mu\text{g/kg}$  folic acid, 0.27  $\mu\text{g/kg}$  vitamin B<sub>12</sub>, , 0.9  $\mu\text{g/kg}$  biotin, , 555  $\mu\text{g/kg}$  pantothenic acid, 486  $\mu\text{g/kg}$  calcium, 208  $\mu\text{g/kg}$  phosphorus, 555  $\mu\text{g/kg}$  magnesium, 97.2  $\mu\text{g/kg}$  zinc, 0.78  $\mu\text{g/kg}$  selenium, 18.1  $\mu\text{g/kg}$  manganese, 0.14  $\mu\text{g/kg}$  chromium, 0.06  $\mu\text{g/kg}$  molybdenum, 277.8  $\mu\text{g/kg}$  potassium, 1,389  $\mu\text{g/kg}$  citrus fruit peel bioflavonoids, 555  $\mu\text{g/kg}$  arginine, 486  $\mu\text{g/kg}$  cysteine, 486  $\mu\text{g/kg}$  inositol, 486  $\mu\text{g/kg}$  carnitine, 97.2  $\mu\text{g/kg}$  coenzyme Q<sub>10</sub>, and 97.2  $\mu\text{g/kg}$  pycnogenol.
8. The nutritional composition of any one of claims 1 to 7, wherein the mammal is a human.
9. A pharmaceutical composition comprising the nutritional composition of any one of claims 1 to 8.
10. Use of the nutritional composition of any one of claims 1 to 8 for the preparation of a pharmaceutical composition for facilitating bone healing in a mammal.
11. The use of claim 10, wherein said mammal is a human.

12. The use of claim 10 or 11, wherein said composition is to be administered orally, intravenously or parenterally.